ABSTRACT

The present invention provides precise temperature estimation in a heat treatment apparatus that estimates temperatures of process objects by using a thermal model and performs a heat treatment while performing a temperature control based on the estimated temperatures. The heat treatment apparatus 1 includes a processing vessel 11 accommodating plural wafers W, plural heaters 31 to 33 and plural temperature sensors S1 to S5, and stores the thermal model. The heat treatment apparatus 1 estimates temperatures of the wafers W based on outputs of the temperature sensors S1 to S5 by using the thermal model and controls the heaters 31 to 33 based on the estimated temperatures, applying a heat treatment to the wafers W. The thermal model for an individual apparatus is made by calibrating a standard thermal model designed for a standard apparatus. The standard model calibration is performed by heating an interior of the processing vessel 11, measuring the temperatures of the wafers W in the processing vessel 11, estimating the temperatures of the wafers W by using the thermal model, comparing the measured temperature and the estimated temperature, and calibrating the standard thermal model so that the measured temperature substantially coincide with the estimated temperature.